

NATIONAL NETWORKS OF THE PUBLIC ADMINISTRATION AND ITS APPLICATION IN THE CONNECTIVITY OF THE EDUCATION SECTOR

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ABSTRACT

National public administration networks are present in many countries, which allow interoperability between all public administration headquarters, such data networks are motivated to provide connectivity and improve state management. This article examines whether the NATIONAL NETWORK OF PUBLIC ADMINISTRATION variable with the dimensions: capacity and price impact on the connectivity of the Education Sector, for this a sample of the entities is used. The analysis is at the Impact level, the research is explanatory, which is

why the methodology of Linear Regression should use. The hypotheses tested, which indicate that the dimensions: assigned capacity and price of the variable NATIONAL NETWORK OF PUBLIC ADMINISTRATION if they influence the connectivity of the education sector. Likewise, it concluded by indicating the values that the NATIONAL NETWORK OF PUBLIC ADMINISTRATION should have in its dimensions in order to improve the current reality in connectivity in these sectors. The sample used is from the Education Sector in Peru of 383 locations.

KEYWORDS: Technology, communication, information, network, administration, connectivity, education.

1. INTRODUCTION

National networks for public administration are composed of a set of communications infrastructures, normally they have transport networks and access networks that allow connectivity to public administration headquarters and provide basic services for information exchange and access to the services.

If we analyze in Peru, telecommunications networks deployed nationwide, such as the National Fiber Optic Dorsal Network (RDNFO), Regional Projects, and telecommunications operator networks. Which intended to resolve the absence of Internet service due to the lack of coverage and the low presence of telecommunications operators in rural areas.

That is why we will analyze and determine how a positive impact of the NATIONAL NETWORK OF PUBLIC ADMINISTRATION would achieved in the Education Sector. The problem being: To what extent does the NATIONAL NETWORK OF PUBLIC ADMINISTRATION affect the connectivity of the Education Sector? In addition, its analysis at the Impact level, is that a quantitative and explanatory investigation is carried out, which is why a sample of the education sectors is used. “In a quantitative investigation it is intended to generalize the results found in a group (sample) to a larger group (population, that is, to the entire education sector)” and the methodology of Linear Regression is used (Sampieri, 2014).

This research shows that the NATIONAL NETWORK OF PUBLIC ADMINISTRATION if it affects education connectivity, for this, the dimensions of the NATIONAL NETWORK OF PUBLIC ADMINISTRATION: capacity and price analyzed.

The interest is to improve our connectivity because developed countries have already made the decision to support their national connectivity (European Commission, 2015) for more than 10 years, carrying out this analysis contributes to match the development of other countries and the knowledge that Their populations already count.

1.2 Problem Formulation

To what extent does the NATIONAL NETWORK OF PUBLIC ADMINISTRATION affect the connectivity of the Education Sector?.

1.3 OBJECTIVES

1.3.1. General objective

Determine the extent to which the NATIONAL NETWORK OF PUBLIC ADMINISTRATION affects the connectivity of the Education Sector.

1.3.2 Specific objectives

- a) Determine to what extent the capacity of the NATIONAL NETWORK OF PUBLIC ADMINISTRATION affects the connectivity of the Education Sector.
- b) Determine to what extent the NATIONAL NETWORK OF THE PUBLIC ADMINISTRATION NETWORK affects the connectivity of the Education Sector.

2. METHODOLOGY

2.1 Method

The research is quantitative. The analysis is at the Impact level, the research is explanatory, which is why the methodology of Linear Regression should be used (Sampieri, 2014).

2.2 Population and sample

2.2.1 Population

As noted in (MAGENTA, 2019) "Quantitative research involves a larger population, since more population means more data to obtain accurate results." The target population are the Entities of the State of the Education Sector in Peru:

Population in the Education Sector

In the Education Sector in Peru there are 85548 Entities in operation and belong to the Public Sector.

2.2.2. Sample

To determine the sample size, we will use the exclusion and inclusion criteria. Inclusion Criteria: Those criteria that include the Sites in the sample

Sector Entities: Education.

- Information registered by: The same Entities on their web pages, for public use.
- Entities in operation
- Public Sector Entities
- Exclusion Criteria: Are those criteria that exclude people from the sample we are going to consider.

- Entities that are not functioning
- Entities that are from the private sector.

Sample size

The sample is found with a confidence level of 95% and a margin of error of 5% using the application <https://es.surveymonkey.com/mp/sample-size-calculator/>

Sample selection

For the selection of the sample, we will use the random sampling of the probabilistic method.

Sample of the Education Sector

The sample size calculated considering the following: Population size 85548, Confidence level: 95%, Margin of error: 5%. Of which the sample is 383 State Education Entities and in operation.

2.3 Variables and indicators

2.3.1. Dependent Variable (Y)

The dependent variable will be the Education Sector.

2.3.1.1 Indicators of the dependent variable (Y)

Dimensions

Bandwidth of the Education Sector in Mbps

Capacity of 4 Mbps at 100%, according to those indicated by (FITEL, 2017).

2.3.2 Independent variable

The independent variable is the NATIONAL NETWORK OF PUBLIC ADMINISTRATION

2.3.2.1. Indicators of the independent variable

Operationalization of variables. This variable NATIONAL NETWORK OF PUBLIC ADMINISTRATION depends on its dimensions, which are:

Table 1: Operationalization of variables Variable Indicator Dimensions.

VARIABLES	DIMENSIONES	INDICADORES
VARIABLE 1: (V. Independent) National Network Of The Public Administration	Dimension 1: Sizing bandwidth	Mbps / Entity
	Dimension 2: Price	\$/Mbps
	Dimension 3: Bandwidth Sector Education	Mbps

Source: self-made

2.3.2.2 Dimensions of the Independent Variable: NATIONAL NETWORK OF THE PUBLIC ADMINISTRATION

2.3.2.2.1 Bandwidth Dimension by Entity

Indicator: Mbps / Entity

It will be analyzed how much is the capacity that the NATIONAL NETWORK OF THE PUBLIC ADMINISTRATION should provide as a standard or contracting mechanism to later evaluate the capacity found would impact on the connectivity of the education sectors.

3. RESULTS AND DISCUSSION

3.1 Hypothesis Tests

3.1.1. Hypothesis

We have the IDI, prepared by the International Telecommunication Union, measures the level of ICT development in the world. (International Telecommunications Union - ITU, 2016), in which Peru ranked at 96.

That is why the dimensions of the NATIONAL NETWORK OF THE PUBLIC ADMINISTRATION variable: capacity and price it is analyze, relating them to the IDI which It represents connectivity.

3.1.2. Specific hypotheses

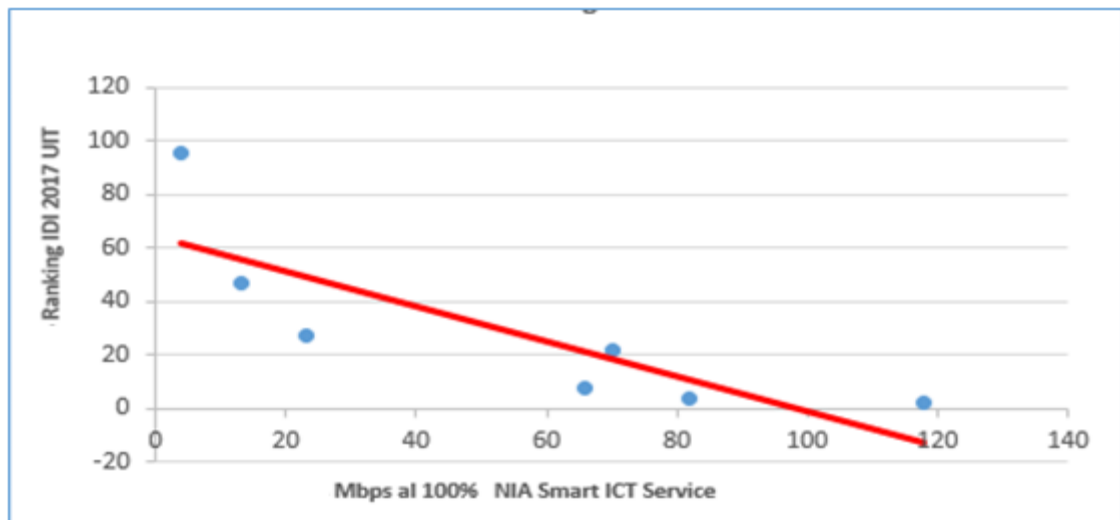
3.1.2.1. The capacity of the NATIONAL PUBLIC ADMINISTRATION NETWORK significantly affects the connectivity of the Education Sector

To make this analysis with the data of what is the connection of schools in Mbps in some countries, which I compare with the ITU IDI 2017 Ranking (International Telecommunications Union - ITU, 2016). To date, Peru, the arithmetic average in capacity is 4 Mbps at 100% per school. This value will be contrasted with the capacity found in Methodology, capacity assigned by student ranks which is 7 Mbps at 100%, according to the calculations made. That is, the Impact measured with the IDI Ranking with the Linear Regression methodology.

Table 2: Internet connection in schools in Mbps and placed in the IDI ranking.

	X = Capacity of the National Network Of Public Administration	Y = connectivity of the Education Sector
	X = Independent Variable	Y = Dependent Variable
Countries	Internet connection in 100% Mbps schools NIA Smart ICT Service 2012 (National Agency of the Information Society, 2014)	Position IDI Ranking 2017 ITU
South Korea	118 Mbps per school	2
Denmark	82 Mbps per school	4
Norway	66 Mbps per school	8
Finland	70 Mbps per school	22
SPAIN	23 Mbps per school	27
ITALY	13 Mbps per school	47
PERU current	4 Mbps per school	96

Source: self-made

**Figure 2: Linear Regression to verify the impact of Mbps capacity.**

Source: self-made

The slope of the regression equation is different from zero, so the equation can be used for prediction purposes. And we have evidence to support that the linear model is correct for our data. That is why we can calculate the Linear Regression formula obtained:

$$y = -0.6541x + 64.566$$

Being x the independent variable, we will calculate the Impact that it would generate if the NATIONAL NETWORK OF THE PUBLIC ADMINISTRATION connectivity is used, of the data calculated in the capacity dimension section.

Being x = 7 Mbps at 100%

Performing the calculations at $y = -0.6541x + 64,566$, we would have to: $y = 59$, that is, the position in the ICT Development Index Ranking (IDI) tends to improve, since we are currently in position 96, for what we can show that the variable capacity NATIONAL NETWORK OF THE PUBLIC ADMINISTRATION if it affects connectivity.

3.1.2.2. The National Public Administration Network price has a significant impact on the connectivity of the Education Sector

Table 3: Price in Peru online and placed in the IDI ranking.

	X = Independent Variable	Y = Dependent Variable
COUNTRIES	Price (% GDP per capita) CEPAL 2012	Impact on Connectivity Position in the IDI Ranking ITU 2017 (International Telecommunications Union - ITU, 2016)
PERU without National Network Of The Public Administration	5,19 % GDP per capita	96
ECUADOR	4,19 % GDP per capita	97
COLOMBIA	4,14 % GDP per capita	84
COSTA RICA	2,28 % GDP per capita	60
ARGENTINA	2,05 % GDP per capita	51
CHILE	1,29 % GDP per capita	56
URUGUAY	1,23 % GDP per capita	42
SPAIN	0,18 % GDP per capita	27
FRANCE	0,06 % GDP per capita	15

Source: self-made

From the table, we see that at a lower price a better position in the IDI is obtained

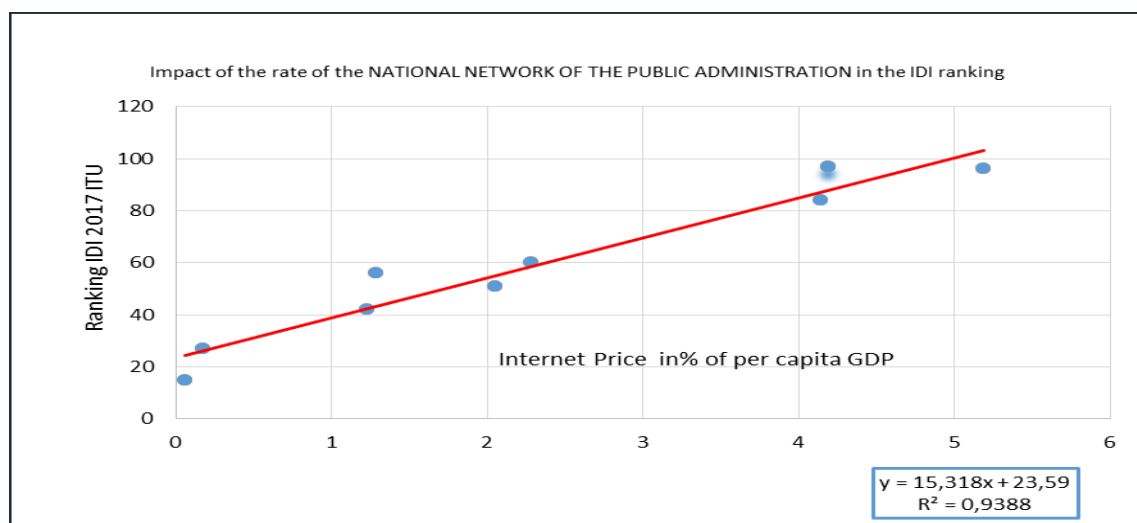


Figure 3: Linear Regression to verify the impact of the online price.

Source: self-made

The equation can be used for prediction purposes. And we have evidence to support that the linear model is correct for our data. That is why we can calculate the Linear Regression formula obtained:

$$y = 15,318 x + 23.59$$

Being x the independent variable, we will calculate the Impact that it would generate if the NATIONAL NETWORK OF THE PUBLIC ADMINISTRATION (% GDP per capita) of the data calculated in the tariff dimension section is used.

Table 4: Price of 1 Mbps with respect to GDP per capita%.

Mbps	CURRENT PRICE	TARIFF found for the National Network Of Public Administration 50% cost	Price at 40% Current Operators
1 Mbps	1,9 GDP per capita %	0,8 GDP per capita %	1,4 GDP per capita %
2 Mbps	2,1 GDP per capita %	1,08 GDP per capita %	1,6 GDP per capita %
% of GDP per capita	1,9 GDP per capita %	0,8 GDP per capita %	1,4 GDP per capita %

Source: self-made

From the formula we apply for the PRICE found for the NATIONAL NETWORK OF PUBLIC ADMINISTRATION $x = 0.8\%$ of GDP per capita, resulting in using this price the position in the ICT Development Index Ranking (IDI) is 36 , that is to say it tends to improve since we are currently in position 96.

Therefore, the variable NATIONAL NETWORK OF THE PUBLIC ADMINISTRATION if it affects the connectivity of the Education Sector, so we can demonstrate that the variable NATIONAL RED tariff OF THE PUBLIC ADMINISTRATION if it affects connectivity.

As a result, we obtain that: the price affect, which is why price is especially important for Education Sector connectivity.

3.2 Presentation of results and discussion

We have found that for the NATIONAL NETWORK OF THE PUBLIC ADMINISTRATION to have an Impact on the Education Sector, several modifications are still required, such as the price scheme, since the price should be at least 50% less than it is currently.

As well as the capacity in which has analyzed how many Mbps should at least be counted in the Education Sector on average 7 Mbps, found from the analysis of its different ranges by number of students.

These results mean that if the NATIONAL NETWORK OF PUBLIC ADMINISTRATION is correctly implemented, the Education Sector would be achieved in line with the implementations carried out in other developed countries, generating an impact on that Sector.

CONCLUSIONS

The adequate capacity for the NATIONAL NETWORK OF THE PUBLIC ADMINISTRATION if it influences the connectivity of the Education Sector since when applying the linear regression model developed in Hypothesis, obtained that Peru improves in its position in IDI going from position 96 to 59.

The capacity of the NATIONAL NETWORK OF THE PUBLIC ADMINISTRATION needed to assign the capacity according to the use and functionality of the headquarters, which is why in the case of schools established with respect to the rank of students, the average being 7 Mbps per school.

The appropriate price for the NATIONAL NETWORK OF THE PUBLIC ADMINISTRATION verified that it affects the connectivity of the Education Sector since by applying the linear regression model developed in 3. Results and Discussion, obtained that Peru improves its position in the ranking IDI improves from 96 to 36. The appropriate price is 0.8% GDP per capita, as indicated in 3.2.2.1.

According to the analysis carried out, if we implement the NATIONAL NETWORK OF PUBLIC ADMINISTRATION proposed with a solution to the capacity and price variables, there would be a direct impact on improving the connectivity of the education sector, which will allow us to improve in the Ranking IDI.

That is why it is important to establish an appropriate contracting model, with the variables price and capacity to impact on connectivity of the education sector, using the networks deployed by the state and the networks of various telecommunications operators.

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